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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/798,650

03/11/2004

Jianying Li

140536

6325

45428

7590

04/28/2011

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EXAMINER

MOTSINGER, SEAN T

ART UNIT

PAPER NUMBER

2624

NOTIFICATION DATE

DELIVERY MODE

04/28/2011

ELECTRONIC

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

USpatents@armstrongteasdale.com

<b>Office Action Summary</b>	<b>Application No.</b> 10/798,650	<b>Applicant(s)</b> LI ET AL.	
	<b>Examiner</b> SEAN MOTSINGER	<b>Art Unit</b> 2624	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☐ Responsive to communication(s) filed on 07 February 2011.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-3,5,6,15-17,19,20,29-31,33 and 34 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-3, 5,6,15-17, 19, 20, 29-31, 33 and 34 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)          | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____                                      |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)          | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____  | 6) <input type="checkbox"/> Other: _____                          |

***Response to Applicants Arguments/Amendments***

Applicants Arguments/Amendments filed on 2/7/2011 have been entered and made of record.

Applicants arguments with respect to the rejections under 35 U.S.C. 103 have been fully considered and the amendments have overcome the rejections.

Applicant's arguments with respect to 35 U.S.C. 103 have been fully considered but are not persuasive. Applicant argues that no combination of Li Hsieh and Kachelries describes "utilizing smoother kernels and projections to produce projections smoothed in three dimensions in accordance with a set of scaled prepped projection thresholds such that when a first threshold is triggered scaling in three dimensions is performed and when a first threshold is not triggered scaling in three dimensions is not performed. Applicant however appears to be arguing the references separately applicant only gives a brief generalized description of the references without addressing the specific rejection applied by the examiner and which reference fails to disclose the features alleged by the examiner. Applicant has not pointed to anything specific that cannot be found in any of the references or a combination of references but merely a paraphrasing several claim elements and gives generalized description of the references without addressing specifics. The examiner does not agree with applicants assertions that the features are not taught by the references as discussed in the rejection below.

***Claim Rejections - 35 USC § 112***

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claims 1-3, 5,6,15-17, 19, 20, 29-31, 33 and 34 rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention “scaled prepped projection thresholds” does not appear to be supported by the specification. The projection are disclosed as scaled and prepped but the thresholds are not. Read in light of the specification it does not appear that disclosure discloses scaling and prepping thresholds. On the other had it does disclose scaling and prepping the projections themselves. Applicant could consider adding and additional step to scale and prep the projections prior to the smoothing step.

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1, 5-6, 15, 19-20 and 29, 33-34 rejected under 35 U.S.C. 103(a) as being rendered obvious by Li et al US 6,449,330 in view of Hsieh et al US 6,529,575 in further view of Kachelriess et al Generalized multidimensional adaptive filtering for conventional and spiral single-slice, multi-slice and Cone-Beam CT. Med Phys. 28 (4) April 2001.

Re claim 1 Li discloses A method for reconstructing an image of an object, said method comprising: scanning an object using a computed tomographic (CT) imaging apparatus (column 3 lines 25-30) to acquire projections of the object; determining a set of scaled prepped projection thresholds (column 4 lines 5-10 note the thresholds are prepared and one is of greater scale and one of lesser scale than a previously known single threshold method); associating selected smoothing kernels with said thresholds (column 4 lines 10-20); utilizing said smoothing kernels (column 4 lines 35-40) and said projections (column 4 lines 35-40) to produce three dimensional (See column 3 lines 35-40) smoothed projections (final projections column 4 lines 35-50) in accordance with said thresholds; and filtering and backprojecting the three dimensional smoothed projections (reconstructing column 4 lines 50-55) to generate an image of the object (column 4 lines 50-55).

Hsieh discloses determining, utilizing the projections, a set of thresholds see column 6 lines 1-15. The motivation to combine is “the ability to separate the real signal variations from the statistical fluctuation “If it is known prior to reconstruction that certain variations

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in the signal data is caused solely by statistical fluctuation, low-pass filters may be applied to the signal data without impacting the spatial resolution of the x-ray image.

The key to differentiating between variations caused by the statistical fluctuations and the real signal variation or structure is the noise characteristic of the measured signal.”

Therefore it would have been obvious to use the adaptive threshold of Hsieh with the noise removal technique of Li to reach the aforementioned advantage.

Li further discloses a first threshold of the set of thresholds triggers smoothing (any one of thresholds one through 3 see lines 25-30 )

Li does not disclose filtering in three dimensions and when the first threshold is not triggered smoothing in three dimensions is not performed. Kachelriess discloses filtering in three dimensions (page 478 section C 3d adaptive filtering) and when the first threshold is not triggered smoothing (below the threshold is does not trigger filtering page 478 section B) in three dimensions is not performed (page 478 section C 3d adaptive filtering). The references are combinable because they both deal with noise reduction of CT data. The motivation is to reduce noise while maintaining high resolution See abstract). Therefore it would have been obvious to combine Kachelriess with Li and Hsieh to reach the aforementioned advantage.

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Re claim 5 Li discloses wherein said utilizing smoothing kernels and said projections to produce smoothed projections comprises utilizing a smoothing gain factor to modulate smoothing of said smoothed projections (column 4 lines 45-50).

Re claim 6 Li further discloses wherein said smoothing gain factor is a function of said projections (column 4 lines 45-50).

Re claim 15 ad 19-20 These claims, recite a ct scanner comprising a detector source and computer system for performing the method of claims 1, 5 and 6 respectively. Li discloses performing the method in a CT scanner as well see column 3 lines 25-40).

Re claim 29 and 33-34. These claims, recite a computer readable medium storing instructions for performing the method of claim 1, 5 and 6 respectively. Li discloses a computer readable medium see column 5 lines 15-20).

Claims 2-3,16-17, and 30-31 are rejected under 35 U.S.C. 103(a) as being unpatentable over Li in view of Hsieh and Kachelriess.

Re claim 2 Li further discloses wherein a smoothing kernel is associated with each threshold (column 4 lines 35-40). Li further discloses the set of thresholds contains

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more than one threshold and in one embodiment the set of thresholds includes three thresholds (column 4 lines 1-10); furthermore one of the smoothing kernels is associated with each threshold (column 4 lines 15-25). Li does not specifically recite that 4 thresholds could be used, however it is clear from the claim language of claim 1 and column 4 lines 1-10 that Li intends the set of thresholds to be discretionary and not necessarily limited to 3 (i.e. Li implies that other numbers of thresholds greater than 1 may be implemented.) Therefore it would be obvious to one of ordinary skill in the art to try a number of thresholds not equal to 3 but greater than 1. The most obvious numbers to try would be 2 and 4 since they are closest to 3. Therefore it would have been obvious to one of ordinary skill in the art to implement Li with 4 thresholds.

Re claim 3 Li further discloses wherein a one-to-one correspondence exists between said smoothing kernels and said thresholds (column 4 lines 35-45).

Re claim 16 and 17 These claims, recite a CT scanner for performing the method of claims 2 and 3 respectively. Li discloses performing the method in a CT scanner as well see column 3 lines 25-30).

Re claim 30 and 31. These claims, recite a computer readable medium storing instructions for performing the method of claim 2 and 3 respectively. Li discloses a computer readable medium see column 5 lines 15-20).



***Conclusion***

**THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to SEAN MOTSINGER whose telephone number is (571)270-1237. The examiner can normally be reached on 9-5 M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Bhavesh Mehta can be reached on 571-272-7453. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Bhavesh M Mehta/

Supervisory Patent Examiner, Art Unit 2624

Motsinger

4/22/2011